FortCady
CaliforniaCorp

August 18, 2021

Mr. David Albright
Groundwater Protection Section
(WTR-4-2) USEPA Region IX
75 Hawthorn Street
San Francisco,
California 94105

RE: Summary of Series 3 Monitor Well Program

Dear Mr. Albright:

Underground Injection Control (UIC) Permit R9UIC-CA3-FY19-1 was issued on August 13, 2020. Part II.F.1 of the permit requires monitor wells to be drilled in Block 2, the initial mining block, after receipt of the permit and prior to commencement of mining. Fort Cady California Corporation (FC3) posted the requisite bond and commenced drilling of the monitor wells in November 2020. This letter report provides a summary of the Series 3 groundwater monitor wells, specifically AOR-3, MW-3a, MW-3b and OW-3. This letter report also discusses lessons learned during the drilling program and requests for moving forward.

As discussed in the permit application, and verified by the groundwater model, the evaporite ore body is located within an uplifted block (the Wedge) defined by the Pisgah Fault to the West and the associated Fault B, to the east. More than 70 wells have previously been drilled within the wedge, but none have identified the presence of a groundwater aquifer in the formations overlying the ore body. However, as part of the UIC permitting process, EPA expressed concerns regarding the lingering potential for a United States Drinking Water Aquifer (USDW) within the approximate 1300 feet above the ore body. To confirm the presence or absence of a USDW above the ore body, FC3 agreed to: drill each of the initial eight (8) groundwater monitor wells, and the first five Injection/Recovery (I/R) wells via air rotary to assist in the identification of water encountered during the drilling program. Each well was drilled air rotary unless problems were encountered in maintaining hole integrity. If additives were required, the order of use were air with foam, air with polymer, then bentonite mud. In addition to drilling primarily with air, FC3 agreed to have geologists on-site while each rig was drilling to log the hole and identify potential water bearing formations. If a potential water bearing formation was identified, then drilling would be suspended while air lift tests were conducted to identify the presence or absence of water.

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Summary of Findings

1. While limited groundwater was encountered in the claystone's and mudstones, FC3 did not identify the presence of an aquifer in the formations overlying the evaporitic Unit 3 (ore zone), in the Series 3 wells.
2. The use of air rotary and airlift testing during drilling prevented the ready identification of subtle visual markers indicating changes in lithology while drilling through Unit 4 into the andesite. The lithologies were more readily identified by the geologist after the chips were dried in the chip trays.
    a. This resulted in drilling all Series 3 wells deeper than their targeted monitor zone, the ore body horizon.
    b. The on-site geologists relogged all chips from each of the Series 3 wells.
    c. Geophysical logs were reviewed to establish the presence and depth of marker beds. The marker beds were then compared to the marker beds identified by Duval and to the lithologic logs. (See Attached CWR Memorandum dated July 16, 2021).
    d. The above information was used by McGinley & Associates in addition to the results from hydraulic testing of AOR-3 and MW-3a during drilling to compare to the model results, which confirmed the model. (See Attached McGinley Memorandum dated August 16, 2021).
3. The use of air rotary caused significant deterioration of the formations while drilling, causing drilling delays, hole instability and influenced the results of geophysical logs and cement job of the well. Where replacement holes are required, mud rotary or similar methodologies will be used.
4. The use of air rotary did allow the rapid identification of groundwater during the drilling program. Once identified, drilling was suspended to conduct air-lift test to confirm sustainability of formation water inflow to the well bore. Discharge measurements were collected to estimate flow over time and the deployment of a pressure transducer recorded recovery data post open borehole airlifting for at least 12 hours. The recovery data was then analyzed for hydraulic conductivity and transmissivity parameters of the exposed formation.
5. The results of the airlift testing of MW-3b did identify the presence of a non-USDW aquifer underlying the Evaporitic Unit 3 (ore body), specifically in the Andesite underlying Unit 4.

Request for Authorization

1. Discussed in more detail in the attached Confluence Water Resources and McGinley Reports, monitor Wells OW-3, AOR-3a and MW3a were drilled below their target horizon.
    a. MW-3a was addressed in previous correspondence and will be plugged back to above the fault gauge. It is anticipated that at least 20 feet of slotted casing will be installed to allow monitoring for the Unit2/4 boundary.
    b. AOR-3a is more than 100 feet below the target horizon. FC3 is proposing to plug back to ~1100 feet below ground surface (bgs) and the casing be perforated via wireline for a 100-foot zone from 1000 to 1100 ft bgs. This will allow the Unit 2/4 boundary to be monitored.
    c. As addressed under separate cover, OW-3 is more than 400 feet below the target horizon. FC3 is proposing to leave OW-3 to monitor the Unit underlying the ore body. A new well,

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OW-3a, will be drilled to a depth of 950 ft bgs, or the Unit 2/4 boundary to monitor the ore body horizon.

Please let me know if you have questions or comments or require additional information.

Sincerely,

C Byrns

Cindi Byrns
Environmental Manager
702-927-3795

Type text here

Attachments: CWR Memo dated July 16, 2021

McGinley Memo dated August 16, 2021

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July 16, 2021

Technical Memorandum

Results of Preliminary Groundwater Testing and Geophysical Surveys Series 3 Wells Fort Cady California Project

This Technical Memorandum has been prepared by Confluence Water Resources, LLC (CWR) to report on the findings from on-going drilling, hydrogeological testing, and geophysical logging of Series 3 Wells which have been drilled pursuant to the Class III UIC permit and the EPA 2approved Monitoring Well Drilling and Completion Plan.

1. Summary of Significant Findings

The following provides a summary of the results from the on-going test work pursuant to the conditions of the permit:

1. There is an apparent fault, the NW Fault, lying between AOR-3 and MW-3a, approximately at the AOR Boundary. The lithological logs from the Series 3 wells indicate the fault down-drops the mudstones of Units 1 through 4 and the underlying andesite, east of MW-3a. Andesite and the overlying conglomerate at the bottom of Unit 4 was encountered at much shallower depths in AOR-3 and MW-3a vs. what was expected, further validating the existence of the fault. The fault is not expected to be a conduit to groundwater flow where it offsets the impermeable mudstones and is expected to be a barrier to any potential groundwater flow in the mudstones east of the project.

2. The results of airlifting during drilling indicate low to no sustainable discharge from Units 1 through Units 4, i.e., zero to two gallons per minute (gpm) and much higher yield from airlift test completed in the andesite, i.e., 20 gpm at MW-3b and 50 gpm at AOR-3. The hydraulic conductivity from the open borehole airlift test at AOR-3 is several orders of magnitude higher than the results from all other test completed, i.e., 0.21 ft/day at AOR-3 vs. 0.004 ft/day at and MW-3a.

   AOR-3 was advanced into andesite and is delineated from the wells completed west of the NW Fault based on permeability and airlift discharge rates during drilling. The deviations in hydraulic conductivity across short lateral distances between wells suggest a high level of vertical anisotropy in the vicinity of the fault, further validating the existence of hydraulic boundaries. Based on the respective airlift tests, discharge/recovery rates and the hydraulic conductivity values generated therefrom, the hydraulic boundaries are expected to be a function of the intrinsic permeability of the mudstone or evaporite beds vs the permeability of the underlaying andesite and undifferentiated volcanics.

3. The airlift test required to observe potential USDWs during drilling have created washout conditions and hole stability issues. The hole stability issues are exacerbated by long-term airlifting to measure potential groundwater discharge. These issues are overcome once the drilling and airlift test are completed using necessary additives such as a bentonite-based drilling fluid. After airlift testing, the fluid additives and washouts impact the results of the geophysical logging required to assess potential USDWs. In some cases, washouts and swelling clays have created bridging conditions in the borehole precluding ability for the logger to access the open borehole.

4. Airlift tests completed during drilling have proven to be the most effective indicator to identify groundwater occurrences and permeability features throughout the project. Airlift tests are less biased when identifying groundwater occurrences and permeability features vs. field interpretation of stratigraphy as the hole is drilled. A detailed geologic log of the hole is required to assess the hydrogeology, but the log does not identify the existence of a USDW without supporting data such as airlift discharge and recovery test, water level measurements, or open hole geophysical surveys. Therefore, continuous 24/7 logging of the geology as the hole is advanced to identify USDWS is not benefieical and should be revisited.

5. Airlift test results, and the hydraulic conductivity estimates derived therefrom remain the best indicator of the extent of groundwater and permeability features throughout the project. The open hole geophysical logs are at best secondary indicators with strong interferences resulting from open hole airlifting required to physically measure discharge and potential groundwater occurrences. The logged geology typically supports the range in test values. A review of the numerical groundwater model for the project indicates the measured hydraulic conductivity values from the open borehole airlift test concurrence with the values assumed in the model. The conglomerate and volcanics at the bottom of Unit 4/top of the andesite were assigned a hydraulic conductivity of about 0.2 feet/day in the model. This is very consistent with the higher permeability of the conglomerate and andesite measured from the AOR-3 airlift. The permeability of the top of the andesite west of the NW Fault, near MW-3a and OW-3, is however several orders of magnitude lower in hydraulic conductivity vs. what was assumed in the model, confirming the conservative model assumptions and suggesting even less possibility to impact a USDW during mining should an aquifer exist deeper in the andesite.

2. Geology and Summary of Lithology Logs from Series 3 Wells

Below is a summary of the four (4) major units throughout the project and tops of each unit encountered in AOR-3, AOR-3a, MW-3a, MW-3b, and OW-3 based on chip samples. Contacts between these units are gradational, and unit thicknesses is approximate.

Unit 1: Characterized by a 500- to 650-foot-thick sequence of oxidized red-brown mudstones with minor sandstone, zeolitised tuff, limestone, and rarely hectorite clay beds. Unit 1 is intersected immediately below the alluvium and surface basaltic lavas.

Unit 2: Characterized by a green-grey mudstone in a reduced oxygen environment that contains minor anhydrite, limestone, and zeolitised tuffs. Unit 2 has a similar thickness (300 to 500 feet) as the overlying Unit 1. Unit 2 is interpreted as lake beds.

Unit 3: Characterized by an evaporite section which consists of rhythmic laminations of anhydrite, clay, calcite, and gypsum. Unit 3 contains the colemanite ore deposit. Anhydrite is the dominant evaporite mineral, and the ore deposit itself is made up primarily of an intergrowth of anhydrite, colemanite, celestite, and calcite with minor amounts of gypsum and howlite. Unit 3 was not encountered in these holes.

Unit 4: Characterized by clastic sediments made up of red and grey-green mudstones and siltstones, with locally abundant anhydrite and limestone. The unit is approximately 150 ft thick and rests directly on the irregular surface of andesitic lava flows. Where drill holes intersect this boundary, it has been noted that an intervening sandstone or conglomerate composed mostly of coarse volcanic debris is usually present.

The tops of each unit logged for the Series 3 holes drilled thus far are summarized below:

Well	Alluvium	Unit 1 Top	Unit 2 Top	Unit 3 Top	Unit 4 Top	Andesite
AOR-3	Surface	~30’ bgs	380’ bgs	Pinched Out	760’ bgs	1020’ bgs
MW-3a	Surface	~30’ bgs	470’ bgs	Pinched Out	850’ bgs	1150’ bgs
MW-3b	Surface	~30’ bgs	490’ bgs	Pinched Out	910’ bgs	1220’ bgs
OW-3	Surface	_30’ bgs	480’ bgs	Pinched Out	960’ bgs	

3. Interpretation of Open Hole Geophysical Surveys

The boreholes are comprised of Clastic lithology. Therefore, the subject NMR data for AOR-3 was processed using global cutoffs for a clastic [clay (3 ms) and capillary (33 ms) bound water] lithology and standard coefficients for permeability equations. It should be noted that in unsaturated media, TPOR report only moisture content and water volume, the hydraulic conductivity outputs are invalid. Minor magnetics, noise and borehole washouts were observed and flagged throughout the AOR-3 log and where above acceptable levels, the sections were also flagged as corrupt and should not be used. It should be noted that the borehole washout/free-water signature appears at a much shorter T2 time than typical of borehole fluid. This could be the result of drilling additives in the mud (such as bentonite) that would shorten the T2 time. BMR and GR data were depth matched to the GR on Combo log. No additional NMR logs were completed for the project due to contractor availability or compromised borehole conditions.

The natural gamma, SP, SPR and resistivity logs provide some indication of changes in lithology. However, the natural gamma does not exclusively identify permeability features since the natural gamma originates from potassium-40 and the isotopes of the uranium-radium and thorium series and not on principals of capillarity like the NMR log. The SP is based on the ionic concentration of fluid outside the borehole relative to the ionic concentration of fluid inside the borehole. The resistivity log measures the electrical resistivity of the borehole wall and material adjacent to the borehole. In evaporite deposits or brine groundwater systems, the SP and resistivity logs are difficult to assess since signature deviations may require corrections based on the natural ionic concentration and type of material drilled. These logs, when assessed with other data, do however provide indication of shifts in ionic concentration or increases in gamma values near the contacts which were logged from the drill chips.

3.1. AOR-3 Summary

E-Logs and Natural Gamma

A strong SPR shift occurs at 330 feet below ground surface (bgs) and at 560 feet bgs. A right shift 75-80 Ohm.m at 770 feet bgs likely signifies the top of Unit 4. A slight right shift from 80-85 Ohm.m at 1030 feet bgs likely signifies the top of the andesite contact which was logged from the chip returns at 1020 feet bgs. However, the resistivity suggests the top of the andesite is clay dominated until about 1110 feet bgs. The increase in electrical signal to 90 Ohm.m at 1160 feet bgs indicate existence of fractured andesite with potential greater fracture density at 1220 feet bgs. These fractures are also consistent with the large drill chip sizes at these depths.

Natural gamma shifts right and strongly increases at 430 feet bgs and at 728 feet bgs then shifts left below 100 API at 730 feet bgs to the end of the hole. These logs could be influenced by the drilling fluid. The SP may show the conglomerate and coarse volcanic debris at 840 feet bgs which was logged by the project geologist at 850 feet bgs from the drill chips. At 1220 feet bgs the SP shows potential shift signifying inflow zones to the borehole from fractures deeper in the andesite.

<u>*Dual Induction Logs*</u>
From the dual induction logs for AOR-3, a change in signal responses was measured at 420 feet bgs and again from 560 to 740 feet bgs, then drifts left at 750 feet bgs dampening response to 850 feet bgs with heavy skin influences. Skin influence appears to decrease below 850 feet bgs with linear dampening and reduction in induction signal below about 1110 feet bgs validating the E-Log interpretation that the andesite is traditionally clay altered to a depth of 1110 feet bgs and more fractured at depth.

3.2. MW-3a Summary

<u>*E-Logs and Natural Gamma*</u>
A strong SPR shift occurs at 360 feet bgs and at 418 feet bgs. At 580 to 620 feet bgs the SPR suggest changes in ionic concentration across the unit or multiple bedding contact. A right shift to 10 Ohm.m at 860 feet bgs likely signifies the top of Unit 4. A second distinct right shift in the SRP from 11-12 Ohm.m at 1110 feet bgs likely signifies the top of the andesite contact which was logged from the chip returns at 1150 feet bgs. The SPR is however much lower in the material encountered in MW-3a vs that of AOR-3. The resistivity from the logs linearly increases at 1100 feet bgs which suggesting the material is not clay dominated and likely andesite.

The SP shifts right over 700 mv below a depth of about 360 feet bgs then continues to drift right, slightly increasing to 740 mv where at 860 feet bgs begins to drift left, lowering in signal indicating the top of Unit 4. The SP then begins to drift right again, increasing in signal at 990 to 1000 feet bgs which likely signifies the conglomerate as it was logged at 1000 feet bgs and was also identifiable with the SP data of AOR-3.

The natural gamma signal is strong at 625 feet bgs but shifts left below 100 API at 630 feet bgs. The signal then increases along the contact occurring at about 860 feet bgs marking the top of Unit 4.

NMR and dual induction logs are not available for this hole.

3.3. MW-3b Summary

Open hole geophysical logs were not achievable due to collapsing hole conditions.

3.4. OW-3 Summary

Open hole geophysical logs have not been provided by the logger.

4. Summary of Airlift Test, Hydraulic Parameters, and Water Levels (Series 3 Boreholes)

The results of the airlift recovery test completed from the Series 3 Boreholes are provided in the CWR report on the Results of Preliminary Groundwater Testing and Water Quality Analysis, CWR 2021. Table 1 provides a summary of those results.

Table 1: Data Summary Table

Hole ID	Testing Depth (FT Bgs)	Discharge (GPM)	Hydraulic Conductivity (FT/Day)	Field TDS	Exposed Screen Depth (FT)	Approx. Water Level (FT Bgs)	Lithology
AOR-3	1,260	50	0.2	3,632	Open Hole	87.83	Test completed in andesite unit, well not completed.
MW-3a	1,260	<1 to Dry	0.0046	3,000	1260-1340	344.58	Test completed from 1260-1300' re-worked volcanics, clay bedding 1320 to 1340' fault gouge. Well screen penetrates andesite below fault. Water level recovers to 344.5 feet bgs.
MW-3b	1500-1600	20	0.1	3,800	1500-1600	336.92	Test completed in andesite unit. Well screen penetrates andesite. Water level recovers quickly to 337 feet bgs.
OW-3	1,340	<1 to Dry	NM	DRY	1255-1360	< 995.83	Test completed near bottom of Unit 4 top of andesite. Well screen penetrates top of andesite. Slow water level recovery rate, still in progress

**NM = Drawdown or Recovery Measurements Not Achievable.*

The Preliminary Groundwater Testing and Water Quality Analysis report indicated that water level elevations will be monitored from the completed wells but based on the airlift test data and the water levels measured therefrom, a significant mound may exist between MW-3a and AOR-3. The offset in levels (approx. 790 feet) suggests existence of a steep hydraulic gradient between the wells. Discharge and hydraulic conductivity generated from the recovery data were significantly different and the data indicate presence of a strong hydraulic boundary between the well pairs.

From the results of additional hydraulic testing, water level measurements in completed wells, open-hole geophysics logs, and the lithological logs indicate the NW Fault is likely a hydraulic boundary both vertically and horizontally depending on existence of clay dominated material or alterations. The fault down-drops the mudstones of Units 1 through 4 and the underlying andesite, west of AOR-3. Andesite and the overlying conglomerate at the bottom of Unit 4 was encountered at much shallower depths in AOR-3 than was expected, further validating the existence of the fault. The fault is not expected to be a conduit to groundwater flow where it offsets the impermeable mudstones, or the top of clay altered andesite at the bottom of Unit 4. This fault is expected to be a strong barrier to any potential groundwater flow in the mudstones.

Deviations in hydraulic conductivity across short lateral distances between AOR-3 and MW-3a suggest a high level of vertical anisotropy in the vicinity of the fault, further validating the existence of hydraulic boundaries. Based on the respective airlift tests, discharge/recovery rates and the hydraulic conductivity values generated therefrom, the hydraulic boundaries are expected to be a function of the intrinsic permeability of the mudstone or evaporite beds vs the permeability of the underlaying andesite and undifferentiated volcanics which is expected to be low near the bottom of Unit 4. Permeability appears to increase in the andesite.

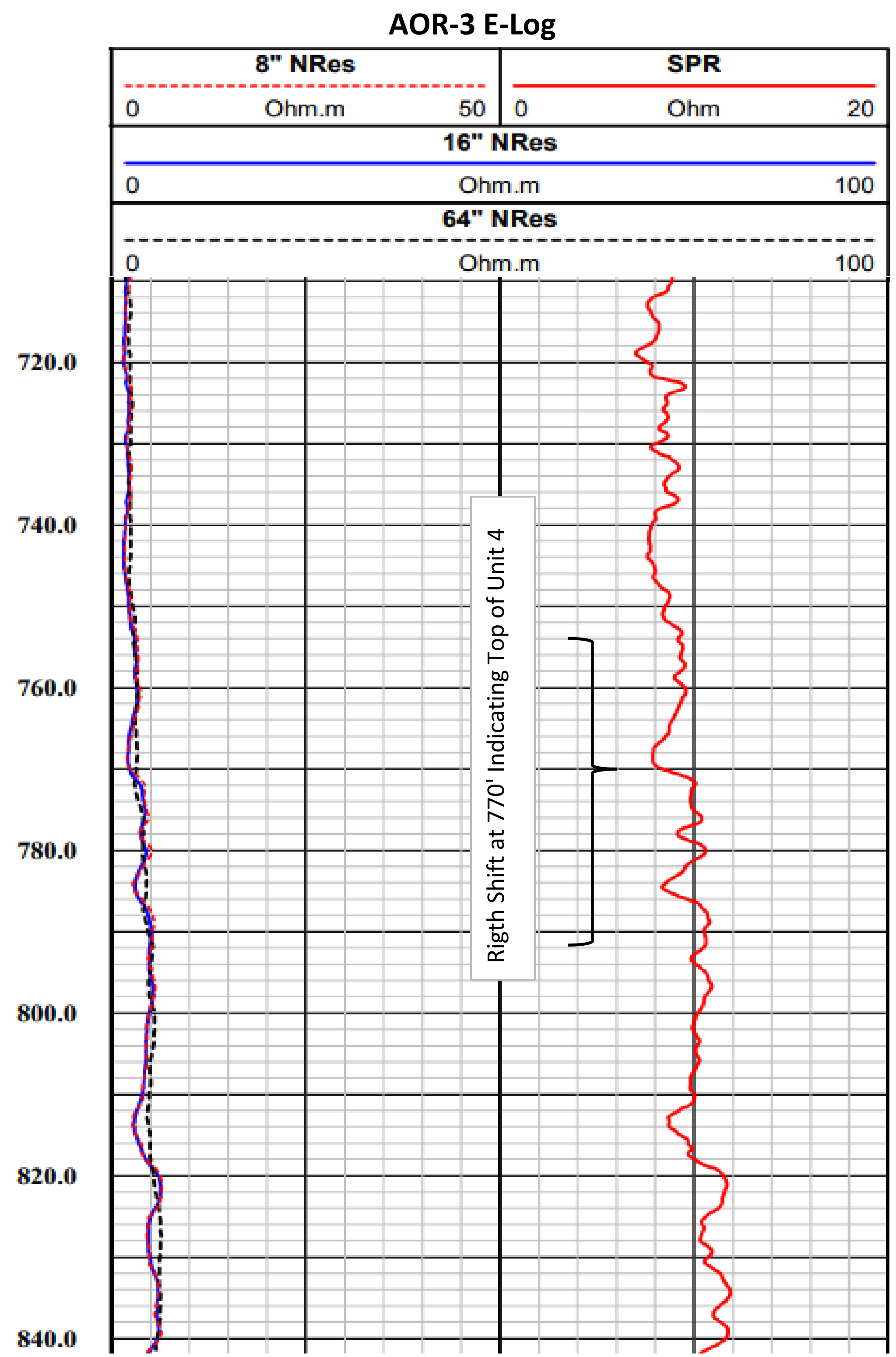
The hydraulic conductivity values from the open borehole airlift test agree with the values assumed in the model. The conglomerate and volcanics at the bottom of Unit 4 top of the andesite were assigned a hydraulic conductivity of about 0.2 feet/day in the model. This is very consistent with the higher permeability measured from the AOR-3 airlift test of the underlying andesite. The permeability of the top of the andesite west of the NW Fault near MW-3a and OW-3 is several orders of magnitude lower vs. what was assumed in the model, suggesting even less possibility to impact a USDW during mining should an aquifer exist deeper in the andesite.

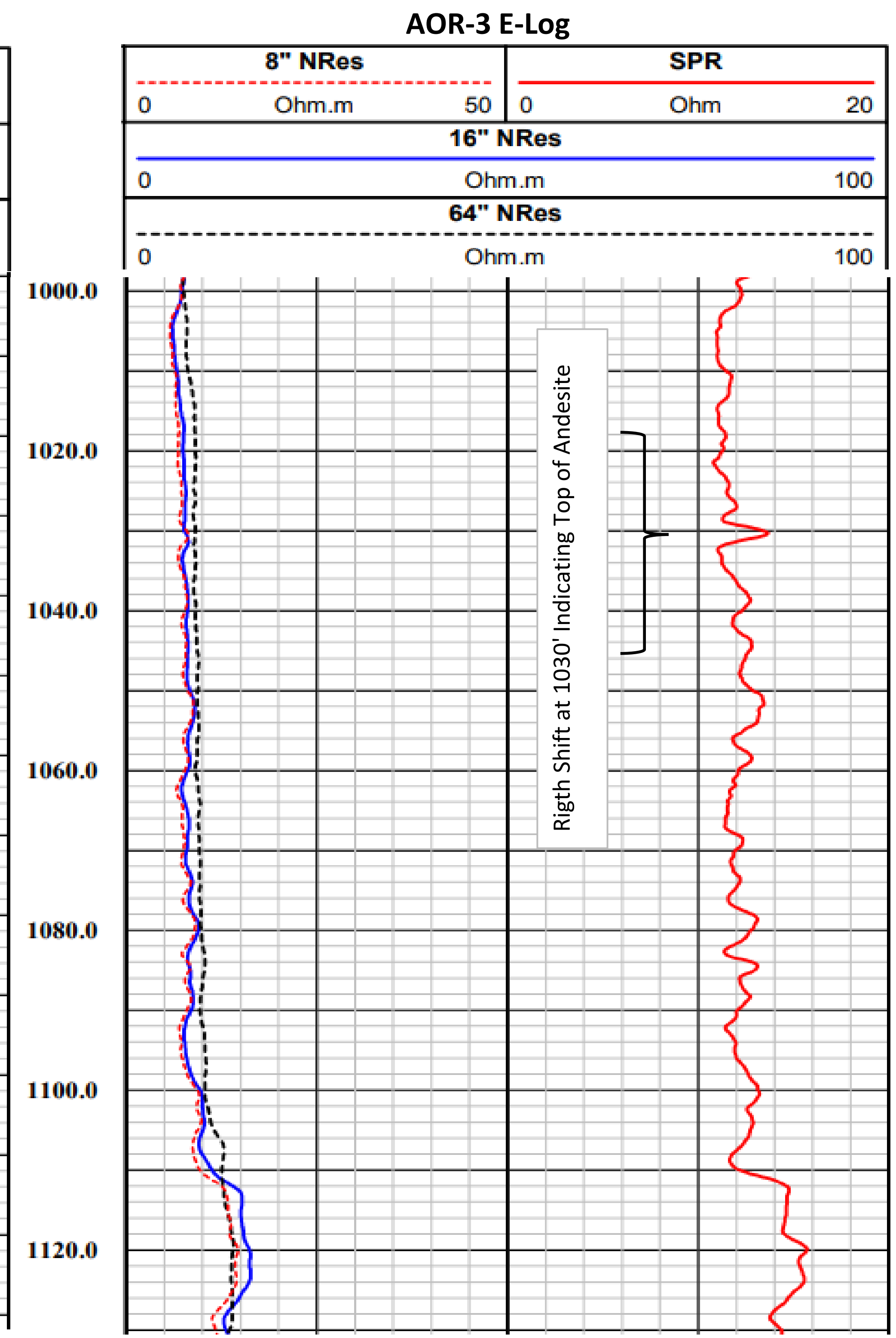
5. Conclusions

- AOR-3 penetrates the andesite shallower than expected since the NW-Fault fault down-drops the mudstones of Units 1 through 4 and the underlying andesite, west of AOR-3 towards the ore body.
- The NW-Fault dips in a westerly direction intersecting MW-3a across the andesite at about 1300 feet bgs.
- As planned and expected, MW-3b penetrates permeability features associated with the andesite underlying the ore body but does not penetrate the fault.
- OW-3 penetrates the clay dominated contact between the bottom of Unit 4 and the top of the andesite, resulting in much slower water level recovery rates and permeability vs. those of AOR-3 and MW-3b which penetrate deeper fractures in the andesite. This zone, well below the Unit 3 ore body, includes the conglomerate at the bottom of Unit 4 near the top of the andesite which was modeled assuming a hydraulic conductivity of 0.2 feet/day and confirmed from the test completed at AOR-3. This value is very conservative compared to tests completed in holes east of the NW Fault along the margins of the andesite contact with Unit 4 where clay dominates and influences the permeability. Along this contact fringe, the hydraulic conductivity may be closer in magnitude to 0.002 feet/day or lower near the top of Unit 4 and at the bottom of Unit 3 where there appears to be no water during drilling. This validates the model predictions since a USDWS was not identified in Unit 4, separating Unit 3 from the andesite.
- Based upon a review of lithologic logs and air-lift testing, OW-3 is completed at the bottom of Unit 4 and not at the Unit 2/4 boundary. Therefore, based upon the model results indicating that mining related solutions will travel horizontally, OW-3 should be utilized to monitor the groundwater underlying the ore body and a new well should be drilled to correctly monitor the Unit 2/4 boundary.
- Observations during drilling and air-lift testing have not identified a USDW in Units 1 or 2.

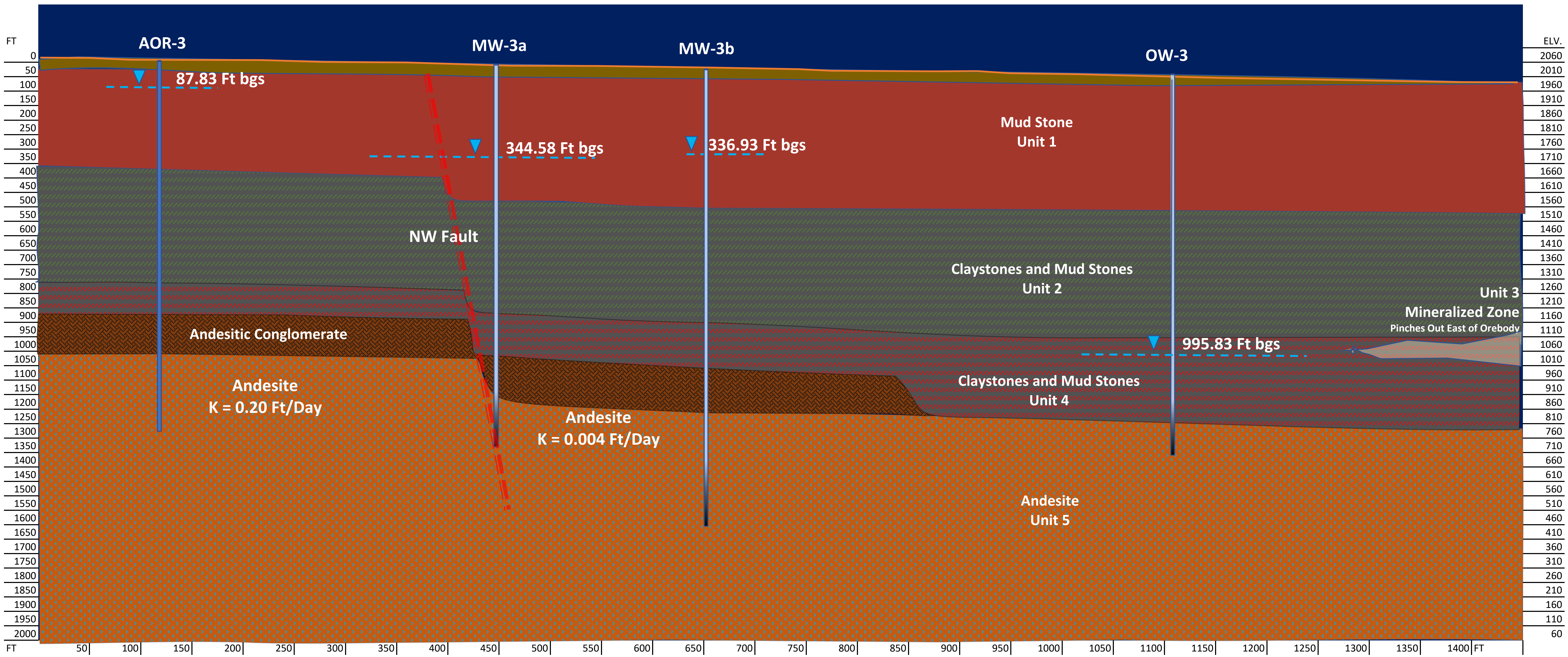
Please direct any questions regarding this Technical Memorandum to Matt Banta of CWR, at 775-843-1908, email mbanta@confluencewaterresources.com or to Cindi Byrns of FC3 email cbyrns@americanpacificborate.com.

Attachments:
Series 3 Cross Section
e-log Marker Beds


AOR-3 E-Log
8" NRes
0 Ohm.m 50
SPR
0 Ohm 20
16" NRes
0 Ohm.m 100
64" NRes
0 Ohm.m 100
720.0
740.0
760.0
780.0
800.0
820.0
840.0
Rigth Shift at 770' Indicating Top of Unit 4


AOR-3 E-Log
8" NRes
0 Ohm.m 50
SPR
0 Ohm 20
16" NRes
0 Ohm.m 100
64" NRes
0 Ohm.m 100
1000.0
1020.0
1040.0
1060.0
1080.0
1100.0
1120.0
Rigth Shift at 1030' Indicating Top of Andesite

Series 3 Holes
Cross Section



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MEMORANDUM

TO:	Matt Banta, Confluence Water Resources	**Date:**	August 16, 2021
CC:	Cindi Byrns, Fort Cady California Corp	**Project:**	Update Fort Cady GW Model
FROM:	Garrett Frey, Hydrogeologist Daniel Pasteris, PhD Geochemist and Hydrologist Dwight Smith, PE PG, Principal Hydrogeologist	**Project No:**	APB-006
SUBJECT:	Lithological Review of 2021 MW OW and AOR Drilling, Fort Cady Borate Mining Project		

McGinley and Associates Inc. (McGinley) has conducted a review of the chip logging and downhole geophysical logging of 2021 MW OW and AOR drilling, to determine the suitability of the data for integration into the existing groundwater model. Observations of the lithologic and geophysical logs are listed in Section 1. Recommendations based on these observations are listed in section 2. A previous cross section through a selection of this recent drilling with comments referring to findings and revisions is included as Attachment 1.

1. Lithological and Geophysical Logging Findings

1. Several logs have the contact of the base of Unit 1/top of unit 2 logged at the color change that exists at the redox boundary. This causes the contact to appear to have no dipping angle.
2. The contact between Unit 1 and 2 is characterized by the transition from a coarser sandy/silty mudstone to finer grained mudstones. This is observed in the borehole geophysics and is captured in several of the chip logs. A reinterpretation of this contact using these criteria, shows the Unit 1 and 2 contact dipping gently ~10° to the southwest.
3. In holes MW-3b and OW-3, the top of an interval of anhydrite/gypsum rich mudstones occurs at ~700 and 740 feet bgl respectively, and in MW-3a there is a very clean mudstone that occurs at a comparable depth. This anhydrite/gypsum bearing bed also has a shallow ~10° southwest dip and projects on the southeast looking cross section between these holes to the southwest to where the Unit 3 is interpreted to have pinched out. It is likely that this is the continuation of Unit 3 which, while not hosting borate mineralization, still contains other evaporites in lacustrine sediments and could be the result of thinning or a facies change towards the deeper portion of the paleobasin.
4. The top of the conglomerate at the base of the lacustrine sediments is very pronounced in both the chip logging and the borehole geophysics. It is denoted by a sharp increase in coarseness of the sediments and a mixed lithology of basalt, tuff, sandstone, and mudstone. This volcanic dominant basal conglomerate is commonly found at the base of the Tertiary sediments in the Mohave. It is likely Eocene in age and is significantly older than the lacustrine sediments. It is generally strongly cemented. In many logs this volcanic conglomerate is still logged as andesite, notably in hole OW-3.
5. An over representation of the basal conglomerate is logged in many of the recent chip logs due to substantial caving/collapsing of this unit during drilling. In some cases, notably MW-3b, the base of the conglomerate was likely penetrated, but due to the overwhelming volume of sample ejected

during drilling of this raveling ground, the bottom 500+ feet of the hole is logged as the conglomerate.

6. Significant over drilling of the boreholes has resulted in many of the recent wells being constructed in the andesitic conglomerate or underlying volcanic bedrock. Additionally, several of the wells were constructed in boreholes that had undergone substantial caving of the andesitic conglomerate during drilling.
7. The ~1 foot of fault gouge intersected in MW-3a can be interpreted as a zone of shearing, rather than a large northwest striking fault that offsets stratigraphy. Chip logging above and below doesn't report mixed lithology types or other damage zone indicators that should accompany a fault of that magnitude. The offsets in units could potentially be explained with southwest dipping beds and a volcanic bedrock that shallows to the northeast, or with dipping beds with much less apparent vertical offset along this structure.
8. The excessively high, and excessively low water levels observed in AOR-3 and OW-3 respectively, would produce an unrealistic and unequilibrated groundwater gradient. These water levels are more probably the result of other factors in the well or borehole and are not representative of the actual water table. For instance, AOR-3 being an open borehole could have partially collapsed high in the hole and have water locally perched at the level.

2. Recommendations

1. Enough drilling and well construction has occurred in the andesitic conglomerate and in the volcanic bedrock to characterize it. All future drilling should stop either at the first appearance of the conglomerate or within unit Unit 4.
2. The existing geologic modelling or cross sections should be updated to account for the ~10° dip of the units.
3. Targeting of future wells could be assisted by geologic modeling of the gently inclined beds. The down or up dip depth of the desired strata for well screen installation could be projected from the model and be the basis of the well design and drilling plan. This could prevent future over drilling, and keep the monitoring/observation wells located within the lacustrine sediments.
4. For modelling purposes, grouping the andesitic conglomerate and the andesite bedrock into an undifferentiated volcanic unit is preferrable since the conglomerate has an irregular surface and is more closely associated with the andesitic bedrock than the lacustrine sediments.
5. A surface geophysical program could be of great assistance to this project. A controlled-source audio magnetotellurics (CSAMT) survey is particularly suitable on this project, because the juxtaposition of electrically conductive volcanic rock versus the much more resistant lacustrine sediments would yield high resolution data. This data would better characterize the structure of the basin, depth to bedrock in the basin, and could indicate structures and or offsets within the basin sediments. Another lower resolution option would be a gravity survey that would associate variations with differences in the distribution of densities of rock types, and would yield a rough plan view structure of the basin and show lineations that could be interpretable as surface expressions of faults.

3. Closing

MGA trusts that this memorandum satisfies the needs of Fort Cady California Company at this time. Should you have any questions or wish to discuss the project, please contact us at (775) 829-2245.

Respectfully submitted,

McGinley and Associates, Inc.

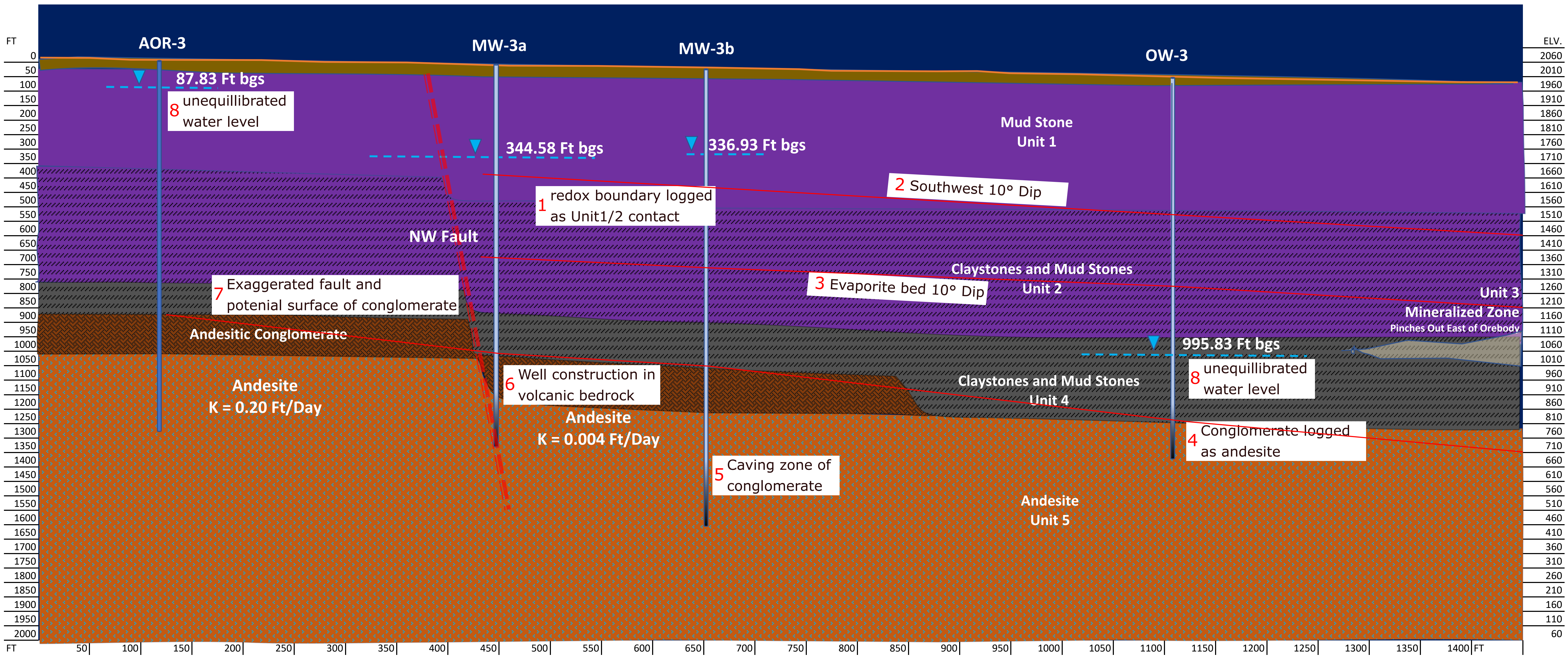
Garrett Frey
Project Hydrogeologist

Dwight L. Smith, PE, PG
Principal Hydrogeologist

Attachments:
1 – Cross Section showing MGA comments and revisions

ATTACHMENT 1

Site Map showing Hydrologic and Topographic Setting of the Humboldt Pit Lake



AOR-3
MW-3a
MW-3b
OW-3
FT
ELV.
87.83 Ft bgs
8 unequillibrated water level
344.58 Ft bgs
336.93 Ft bgs
Mud Stone Unit 1
2 Southwest 10° Dip
1 redox boundary logged as Unit1/2 contact
NW Fault
Claystones and Mud Stones Unit 2
3 Evaporite bed 10° Dip
Unit 3
Mineralized Zone
Pinches Out East of Orebody
7 Exaggerated fault and potenial surface of conglomerate
Andesitic Conglomerate
995.83 Ft bgs
8 unequillibrated water level
Claystones and Mud Stones Unit 4
Andesite
K = 0.20 Ft/Day
6 Well construction in volcanic bedrock
Andesite
K = 0.004 Ft/Day
4 Conglomerate logged as andesite
5 Caving zone of conglomerate
Andesite Unit 5